



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Doris, et al.

Serial No.: 10/710,272

Group Art Unit: 2812

Filed: June 30, 2004

Examiner: Tsai, H.

For: METHOD AND STRUCTURE FOR STRAINED FINFET DEVICES

Honorable Commissioner of Patents
Alexandria, Virginia 22313-1450

DECLARATION UNDER 37 C. F. R. §1.131

Sir:

We, Bruce Bennett Doris, Diane C. Boyd, and Huilong Zhu, do hereby state that:

- 1) We are the inventors of the above-identified application.
- 2) The method, system, and program products for distributed content throttling in a computing environment was known to us earlier than June 2, 2004, as shown in the enclosed memorandum (Exhibit 1). The effective date of the memorandum (Exhibit 1) is earlier than June 2, 2004, and the date thereof has been redacted.
- 3) The contents of the enclosed memorandum (Exhibit 1) have been incorporated into the specification of the present invention, upon which claims 1-30 are based. For example, the memorandum paragraph (e.g., A) describing the problem being addressed and beginning with the words "Double gate devices are the most suitable ..." can be found in the specification (e.g., in paragraph [0002]).

The memorandum paragraph (e.g., B) beginning with the words "Another advantage ..." can be found in the specification (e.g., in paragraph [0006]).

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The memorandum paragraph (e.g., C) beginning with the words “A unique aspect of the ...” can be found in the specification (e.g., in paragraph [0028]).

The memorandum paragraph (e.g., D) beginning with the words “This invention takes advantage ...” can be found in the specification (e.g., final sentence in paragraph [0028]).

4) Regarding the present invention itself, the memorandum paragraph (e.g., E) beginning with the words “An SOI wafer ... ” can be found in the specification (e.g., in paragraph [0030]).

The memorandum paragraph (e.g., F) beginning with the words “Well implants may be implanted ...” can be found in the specification (e.g., in paragraph [0031]).

The memorandum paragraph (e.g., G) beginning with the words “The extension are implanted ...” can be found in the specification (e.g., in paragraph [0032]).

The memorandum paragraph (e.g., H) beginning with the words “A dielectric film of ...” can be found in the specification (e.g., in paragraphs [0033] and [0034]). It is noted that independent claim 1 is also demonstrated in the memorandum paragraph.

The memorandum paragraph (e.g., I) beginning with the words “A similiar lithography ...” can be found in the specification (e.g., in paragraphs [0035] and [0036]).

The memorandum figure (e.g., AA) can be found in the specification (e.g., in Figure 3).

The memorandum figure (e.g., BB) can be found in the specification (e.g., in Figure 4).

The memorandum figure (e.g., CC) can be found in the specification (e.g., in Figure 5).

The memorandum figure (e.g., DD) can be found in the specification (e.g., in Figure 6).

The memorandum figure (e.g., EE) can be found in the specification (e.g., in Figure 7).

An attachment figure (e.g., FF) to the memorandum can be found in the specification (e.g., in Figure 9).

An attachment figure (e.g., GG) to the memorandum can be found in the specification (e.g., in Figure 10).

5) The above clearly evidences a completion of the invention in this country before the filing date (e.g., June 2, 2004) of U.S. Patent Application Publication No. US 2004/0259315 A1 to Sakaguchi et al.

6) In the alternative, we declare that the claimed invention was conceived prior to June 2, 2004 (e.g., as shown by the attached Memorandum (Exhibit 1) having a date (now redacted) prior to June 2, 2004) and, coupled with due diligence from a date before June 2, 2004, that the invention was constructively reduced to practice on June 30, 2004. That is, as evidenced by Exhibits 2 and 3, the first version of the Application completed review at McGinn Intellectual Property Law Group and was sent to the inventors and to the IBM Intellectual Property Department via facsimile on May 24, 2004. Exhibits 4-22 evidence the almost-daily account of the effort to get the Application delivered to the IBM Intellectual Property Department on June 23, 2004, and the executed formal papers were filed electronically on June 30, 2004.

Declaration Under Rule 37 CFR §1.131

S/N 10/710,272

Attorney Docket FIS920030389US1

7) The facts above in 5) clearly show a completion of the invention in the U.S. before June 2, 2004. Alternatively, the facts in 6) above show a conception of the invention, prior to June 2, 2004, and due diligence from just before June 2, 2004, to the filing date (i.e., the constructive reduction to practice) of the Application on June 30, 2004.

We hereby declare that all statements made here are of own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the Application or any patent issued thereon .

Further declarants sayeth not.

Date:

Bruce Bennett Doris

Date:

Diane C. Boyd

Date:

Huilong Zhu

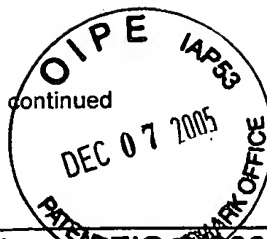


EXHIBIT 1



Main Idea for Disclosure FIS8-2003-0292

Prepared for and/or by an IBM Attorney - IBM Confidential

Archived On

01:02:44 AM

Title of disclosure (in English)
STRAINED FinFET DEVICES

Main Idea

1. Background: What is the problem solved by your invention? Describe known solutions to this problem (if any). What are the drawbacks of such known solutions, or why is an additional solution required? Cite any relevant technical documents or references.

(A) Double gate devices are the most suitable choice for next generation devices. The improved short channel effect control and increased drive current that double gates deliver is needed. One of the most simple double gate devices to fabricate is the FinFET. The reason for this is that the front gate and back gate are self-aligned. Also, the front gate oxide and back gate oxide are processed simultaneously.

(B) Another advantage of the FinFET is that since the active areas are all the same size in the length dimension, any stress enhancement in the direction along the current flow is potentially equal in magnitude for all devices. Thus, the mobility improvement and current increase should be similar for all devices.

(C) A unique aspect of the FinFET is that since all devices have the same width, FinFET circuits require a number of Fin's to be connected. One method for connecting the Fins is to define Si regions as shown in Figure 1.

(D) This invention takes advantage of this particular configuration by improving carrier mobility by local mechanical stress.

To our knowledge, this idea is not contained in the prior art .

The invention as described below has broad structure as well as method claims .

This invention is detectable using standard failure analysis techniques like cross sectional SEM .

2. Summary of Invention: Briefly describe the core idea of your invention (saving the details for questions #3 below). Describe the advantage(s) of using your invention instead of the known solutions described above.

3. Description: Describe how your invention works, and how it could be implemented, using text, diagrams and flow charts as appropriate.

(E) An SOI wafer is provided. The SOI layer is about 800A in thickness. Next an oxide hard mask of about 400A is formed by thermal oxidation of the SOI wafer. Next the active regions are patterned by lithography and etching. The Fins 1 are connected together by the Fin connectors 2, as shown below.

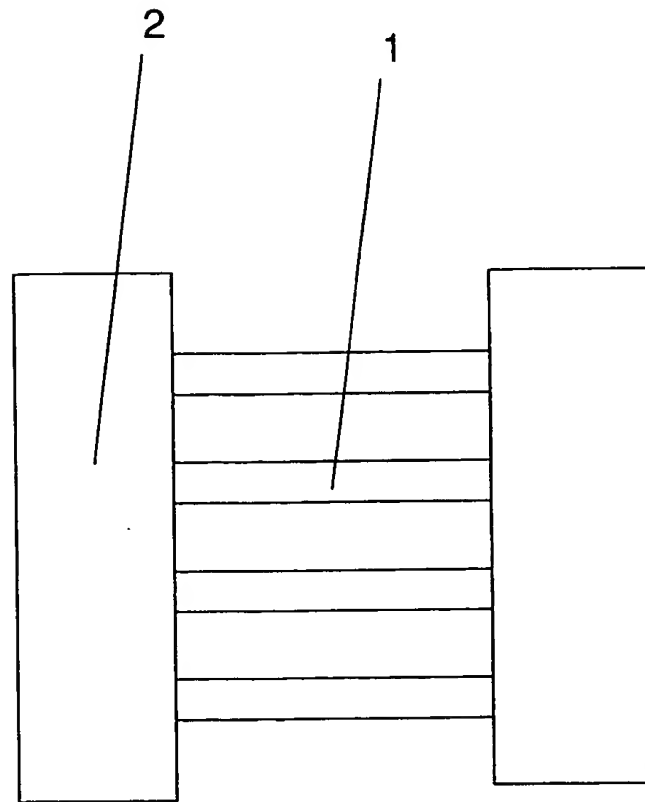
Figure 1

EXHIBIT 1

Top-down view

1 Fin's

2 Fin connectors



AA

Figure 2

Well implants may be implanted and annealed followed by gate oxidation. The gate electrode 3 is patterned by first depositing a gate material like poly- Si. The poly- Si can be planarized by CMP, after which a lithography and etch process is carried out. The structure appears as shown below:

EXHIBIT 1

3-gate electrode after patterning

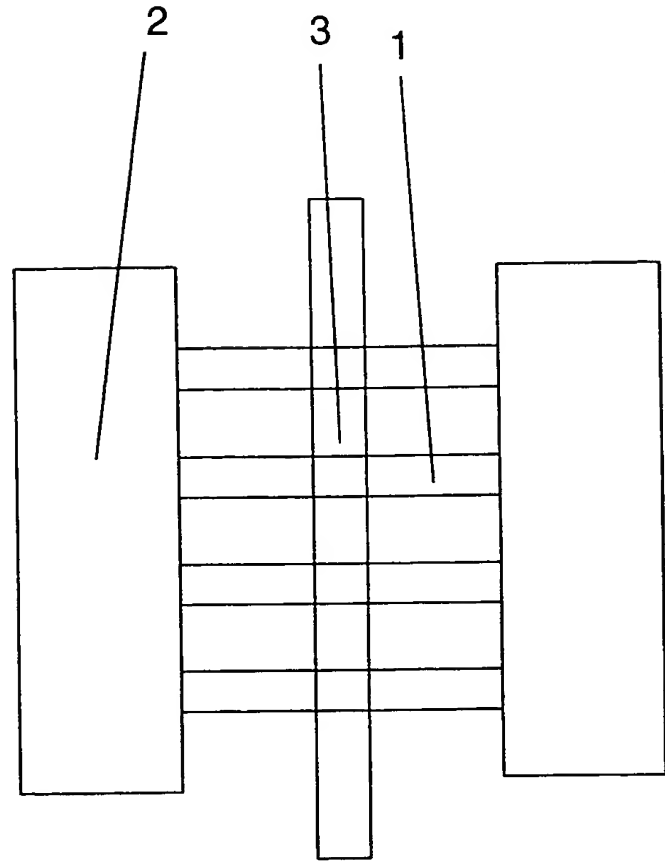
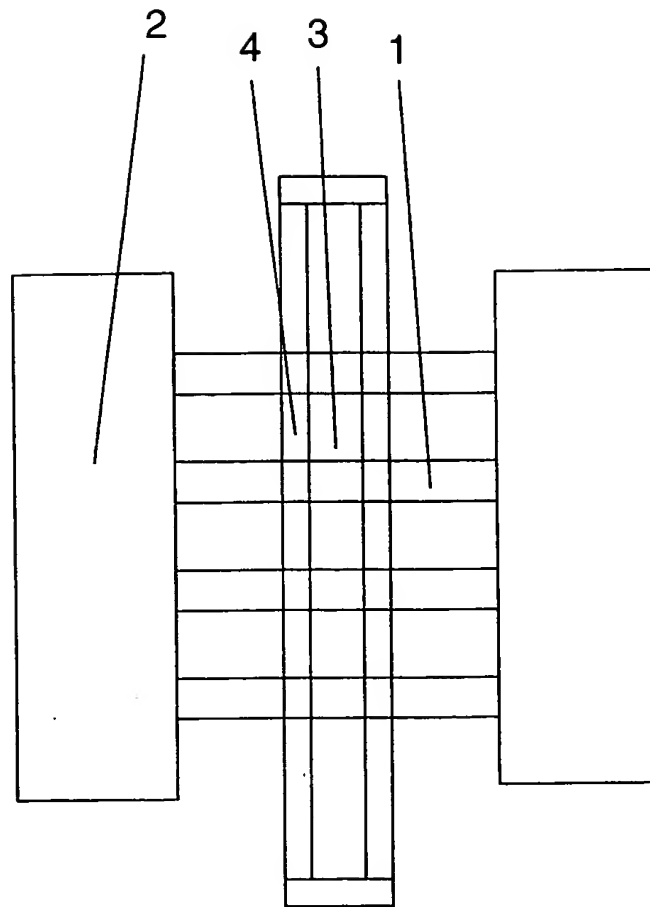


Figure 3

6 The extension are implanted using an ion implantation process. The source drain spacers 4 are next formed by depositing an oxide liner followed by depositing a SiN layer of about 500A. A directional etch is then used to form the spacers 4. After spacer formation, Source-Drain implants are performed using an ion implantation process. Raise source drains, not shown in the figures, are grown by selective epitaxial Si. Silicide, also not shown in the figures, is formed by reacting metal like Co, Ti or Ni for example, with the exposed Si.

EXHIBIT I.

4-spacer

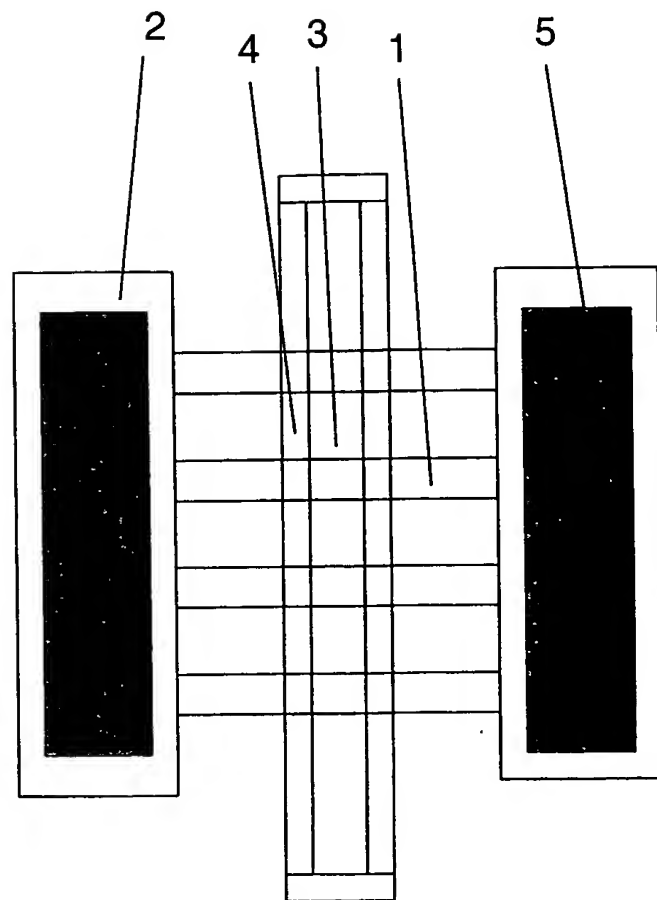


(H) A dielectric film of thickness about 5000Å is next deposited and planarized by CMP. The dielectric film may be BPSG HDP or TEOS. A lithography and etch process used to open the shaded regions 5 of the Fin connectors 2. In the case of the pFinFET, the Si region of the connector may be etched and filled with a compressive material. One choice for the compressive material is compressive SiN, another choice is to silicide the open hole, without etching the Si region, using a highly compressive silicide like PdSi or Pt silicide. It is worth noting that the compressive material need not be conductive, the purpose of the compressive material is to impart compressive stress to the channel. If the channel regions are small and the compressive material has sufficient volume and is sufficiently close to the channel region then a significant amount of stress of the order of -1000MPa or more may be transferred to the channel region. This will have a mobility enhancement of greater than 70%.

EXHIBIT 1

DD

5-compressive material



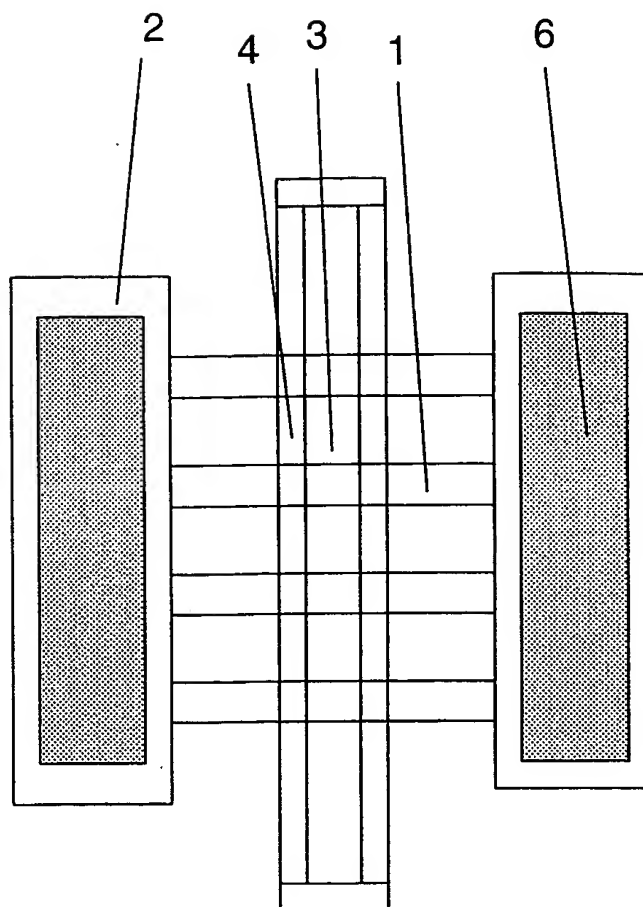
I

A similar lithography and etch process is used to open the shaded regions 6 of the nFin connectors 2. In the case of the nFinFET, the Si region of the connector may be etched and filled with a tensile material. One choice for the tensile material is tensile SiN, another choice is to silicide the open hole, without etching the Si region, using a highly tensile silicide like CoSi₂ silicide for example. It is worth noting that the tensile material need not be conductive, the purpose of the tensile material is to impart tensile stress to the channel. If the channel regions are small and the tensile material has sufficient volume and is sufficiently close to the channel region then a significant amount of stress of the order of +1000MPa or more may be transferred to the channel region. This will have a mobility enhancement of greater than 70%.

EXHIBIT 1.

EE

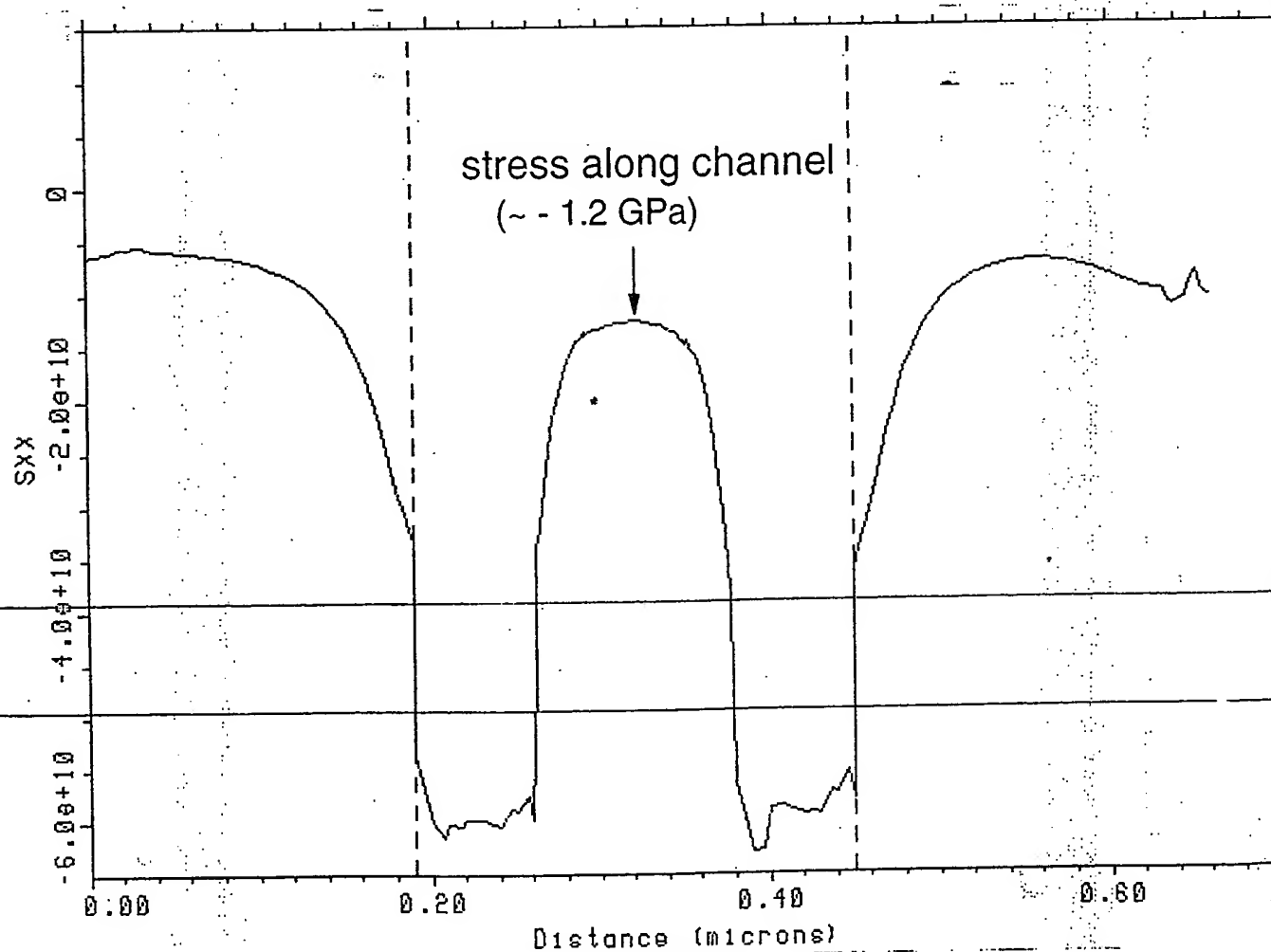
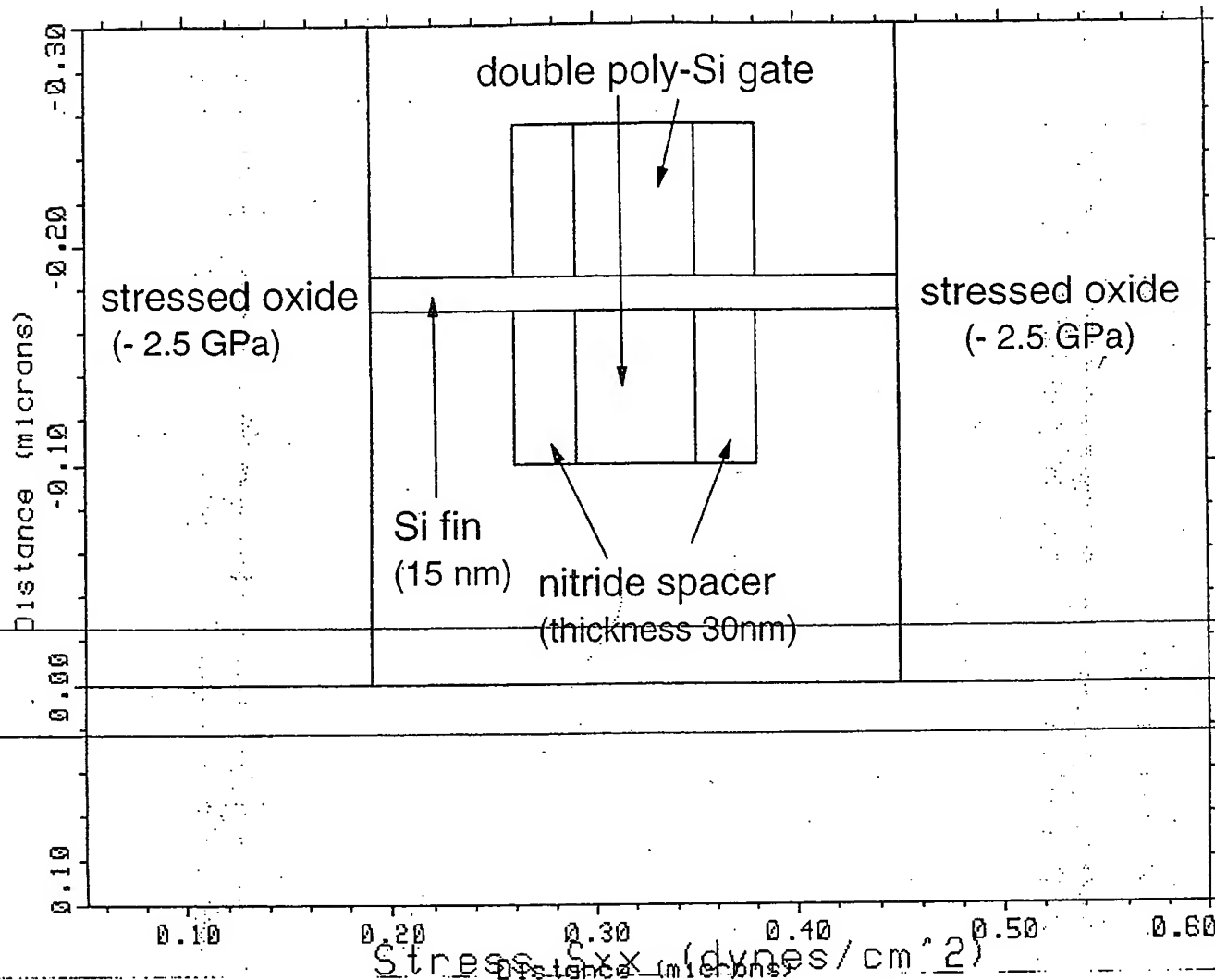
6-tensile material



Final Simulation Structure

EXHIBIT 1

FP



GG

EXHIBIT 2

LAW OFFICES OF
McGINN & GIBB, PLLC

A PROFESSIONAL LIMITED LIABILITY COMPANY
PATENTS, TRADEMARKS, COPYRIGHTS, AND INTELLECTUAL PROPERTY LAW
8321 OLD COURTHOUSE ROAD, SUITE 200
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FREDERICK E. COOPERRIDER†
PETER A. BALNAVE, Ph.D.
FREDRIC J. ZIMMERMAN†
JAMES E. HOWARD†
JAMES N. DRESSER
JOHN J. DRESCH
SCOTT M. TULINO
†MEMBER OF BAR OTHER THAN VA

ANNAPOLIS, MD OFFICE
FREDERICK W. GIBB, III
LAWRENCE A. SCOTT†

FACSIMILE COVER SHEET

(This cover page + 23 sheets)

FROM: Frederick E. Cooperrider
Phone: (703) 761-2377

DATE: 5/24/04

TO:

Bruce Doris

Fax: 1-845-892-3039
Ph: _____

RE:

FIS 920030389 US1 (Disclosure FIS 8-2003-02)

COMMENTS:

Bruce, I have not been able to get the IBM
Drop Box to work, so I am faxing the first
draft. Please call me at (703) 761-2377.
Fred Cooperrider

This facsimile message and attachments (if any) may contain information that is privileged, confidential, attorney-work product, or otherwise exempt from disclosure under applicable law. This message and any attachment(s) are intended for only the individual or entity named above (or those properly entitled to access the information). If the reader of this transmission is not the intended or an authorized recipient, any unauthorized distribution, dissemination, or copying of this transmission and the attachment(s), if any, is prohibited.

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EXHIBIT 3

LAW OFFICES OF
McGINN & GIBB, PLLC

A PROFESSIONAL LIMITED LIABILITY COMPANY
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JOHN J. DRESCH
SCOTT M. TULINO
†MEMBER OF BAR OTHER THAN VA

ANNAPOLIS, MD OFFICE
FREDERICK W. GIBB, III
LAWRENCE A. SCOTT†

FACSIMILE COVER SHEET

(This cover page + 23 sheets)

FROM: Frederick E. Cooperrider
Phone: (703) 761-2377

DATE: 5/24/04

TO:

Margaret Pepper
Fax: 845-892-6363
Ph: _____

RE:

first draft for HS 9203-0389US1

COMMENTS: _____

This facsimile message and attachments (if any) may contain information that is privileged, confidential, attorney-work product, or otherwise exempt from disclosure under applicable law. This message and any attachment(s) are intended for only the individual or entity named above (or those properly entitled to access the information). If the reader of this transmission is not the intended or an authorized recipient, any unauthorized distribution, dissemination, or copying of this transmission and the attachment(s), if any, is prohibited.

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Subj: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/2/2004 10:14:00 PM Eastern Standard Time
From: mpepper@us.ibm.com (Margaret Pepper)
To: FCooperrider@aol.com

EXHIBIT 4

Fred,

What is the status of this application? Last time we spoke, you were faxing the draft application to Bruce. Have you received comments from Bruce?

Best regards,

Margaret

PREPARED BY IBM ATTORNEY - PRIVILEGED AND CONFIDENTIAL

Margaret A. Pepper
Staff Attorney, IP Law Department
IBM Corporation
2070 State Route 52, B/300, Z/482
Hopewell Junction, NY 12533
(845) 894-4713, tie-line 533-4713
mpepper@us.ibm.com

— Forwarded by Margaret Pepper/Fishkill/IBM on 06/02/2004 10:12 PM

FCooperrider@aol.com
05/24/2004 11:17 AM

To
Margaret Pepper/Fishkill/IBM@IBMUS
cc

Subject

Re: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1

Hi, Margaret

Yes, I am still using this email address. The first draft for FIS9-2003-0389US1 has been completed for over a week but I have been unable to use the drop box. I advised the customer service, who forwarded a request to you for authorization. I spent about two hours this morning trying to download the software but the download keeps hanging up at 39 percent on the fourth of the four modules.

Therefore, I am giving up on the drop box approach and have instead faxed a copy of the first draft to Bruce at 845-892-3039.

You had requested to be copied on the drafts, so please forward a copy of your fax number so I can also get the first draft to you.

Subj: Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/3/2004 9:32:17 AM Eastern Standard Time
From: FCooperider
To: mpepper@us.ibm.com

EXHIBIT 5

Margaret,

I have left telephone messages to Bruce twice now. I will try again today. He does tend to be a bit hard to contact.

Did you have any comments on the first draft?

Fred Cooperider

EXHIBIT 6

Subj: Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/3/2004 8:25:49 PM Eastern Standard Time
From: mpepper@us.ibm.com (Margaret Pepper)
To: FCooperider@aol.com

Fred,

I have no comments. It looks good.

Bruce responded to me last night that your first draft looked, he made some comments and planned to fax them to you today. Did you receive his comments?

By the way, his e-mail address is dorisb@us.ibm.com.

Best regards,

Margaret

PREPARED BY IBM ATTORNEY - PRIVILEGED AND CONFIDENTIAL

Margaret A. Pepper
Staff Attorney, IP Law Department
IBM Corporation
2070 State Route 52, B/300, Z/482
Hopewell Junction, NY 12533
(845) 894-4713, tie-line 533-4713
mpepper@us.ibm.com

FCooperider@aol.com
06/03/2004 09:32 AM

To
Margaret Pepper/Fishkill/IBM@IBMUS
cc

Subject
Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1

Margaret,

I have left telephone messages to Bruce twice now. I will try again today. He does tend to be a bit hard to contact. Did you have any comments on the first draft?
Fred Cooperider

Subj: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/4/2004 9:54:36 AM Eastern Standard Time
From: mpepper@us.ibm.com (Margaret Pepper)
To: teri@us.ibm.com (Teri McDonald)
CC: FCooperider@aol.com

EXHIBIT-7

Teri,

Please forward the inventor profile information to Fred at his fax number below.

Thanks,

Margaret

PREPARED BY IBM ATTORNEY - PRIVILEGED AND CONFIDENTIAL

Margaret A. Pepper
Staff Attorney, IP Law Department
IBM Corporation
2070 State Route 52, B/300, Z/482
Hopewell Junction, NY 12533
(845) 894-4713, tie-line 533-4713
mpepper@us.ibm.com

— Forwarded by Margaret Pepper/Fishkill/IBM on 06/04/2004 08:41 AM
—

FCooperider@aol.com
06/04/2004 12:31 AM

To
Margaret Pepper/Fishkill/IBM@IBMUS
cc

Subject
Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1

Thanks, Margaret

As soon as we get the inputs from Bruce, we should be close to filing.

Do you have the inventor information in your file. If so, please forward via email or fax. If not, I will request via Bruce.

Fred Cooperider
McGinn&Gibb, PLLC
email: fcooperider@aol.com
or mcginngibb@aol.com
ph: (703) 761-2377
fax: (703) 761-2375

EXHIBIT 8

Subj: Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/4/2004 10:22:32 AM Eastern Standard Time
From: teri@us.ibm.com (Teri McDonald)
To: FCoopemider@aol.com
CC: mpepper@us.ibm.com (Margaret Pepper)

Fred: Here are the inventor profiles:

Huilong Zhu
93 Autumn Drive
Poughkeepsie, NY 12603
Citi: China

Bruce B. Doris
350 Lake Shore Drive
Brewster, NY 10509
Citiz: US

Diane C. Boyd
162 Martin Road
LaGrangeville, NY 12540
Citiz: US

If you need anything further, please let me know.

Teri McDonald, Paralegal
Intellectual Property Law Department
IBM Corporation
2070 Route 52
Hopewell Junction, NY 12533
Tel- 845-892-4279
Fax- 845-892-6363

Margaret Pepper/Fishkill/IBM
06/04/2004 08:42 AM

To
Teri McDonald/Fishkill/Contr/IBM
cc
FCoopemider@aol.com
Subject
Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1

Teri,

Please forward the inventor profile information to Fred at his fax number below.

Thanks,

Margaret

EXHIBIT 9

Subj: **Status of First Draft for FIS9-2003-0389-US1**
Date: 6/4/2004 2:45:06 PM Eastern Standard Time
From: FCooperider
To: dorisb@us.ibm.com

Bruce,

How is it coming on the comments/corrections for the first draft of the application on local strained finfet devices? Margaret Pepper thought you might be attempting to fax me corrections, so I provide my fax number below, in case you do not have it.

We should be close to filing once we get your inputs.

Thanks,

Fred Cooperider
McGinn&Gibb, PLLC
ph: (703) 761-2377
fax: (703) 761-2375
email: fcooperider@aol.com

EXHIBIT 10

Subj: Re: Status of First Draft for FIS9-2003-0389-US1
Date: 6/4/2004 3:17:31 PM Eastern Standard Time
From: dorisb@us.ibm.com (Bruce Doris)
To: FCooperrider@aol.com

I will fax my comments to you shortly.

We are close to being done.

Please review the comments and call if there are questions.

-Bruce

----- Headers -----

Return-Path: <dorisb@us.ibm.com>
Received: from rly-xi02.mx.aol.com (rly-xi02.mail.aol.com [172.20.116.7]) by air-xi02.mail.aol.com (v99_r4.8) with ESMTP id MAILINX122-4c840c0cac61b9; Fri, 04 Jun 2004 15:17:31 -0400
Received: from e5.ny.us.ibm.com (e5.ny.us.ibm.com [32.97.182.105]) by rly-xi02.mx.aol.com (v99_r4.3) with ESMTP id MAILRELAYINX124-4c840c0cac61b9; Fri, 04 Jun 2004 15:17:26 -0400
Received: from northrelay04.pok.ibm.com (northrelay04.pok.ibm.com [9.56.224.206])
by e5.ny.us.ibm.com (8.12.10/8.12.2) with ESMTP id i54JHQpP512634
for <FCooperrider@aol.com>; Fri, 4 Jun 2004 15:17:26 -0400
Received: from d01ml076.pok.ibm.com (d01av04.pok.ibm.com [9.56.224.64])
by northrelay04.pok.ibm.com (8.12.10/NCO/VER6.6) with ESMTP id i54Jl6ZK108860
for <FCooperrider@aol.com>; Fri, 4 Jun 2004 15:18:06 -0400
In-Reply-To: <ca.2c840e8e.2d21d32@aol.com>
Subject: Re: Status of First Draft for FIS9-2003-0389-US1
To: FCooperrider@aol.com
X-Mailer: Lotus Notes Release 6.0.2CF1 June 9, 2003
Message-ID: <OFD8BF8BE7.CA8C571C-ON85256EA9.0069C900-85256EA9.006A083C@us.ibm.com>
From: Bruce Doris <dorisb@us.ibm.com>
Date: Fri, 4 Jun 2004 15:17:22 -0400
X-MIMETrack: Serialize by Router on D01ML076/01/M/IBM(Release 6.0.2CF2 HFB2|May 18, 2004) at
06/04/2004 15:17:24
MIME-Version: 1.0
Content-type: text/plain; charset=US-ASCII
X-AOL-IP: 32.97.182.105
X-AOL-SCOLL-SCORE: 0:XXX:XX
X-AOL-SCOLL-URL_COUNT: 0

Subj: Re: Status of First Draft for FIS9-2003-0389-US1
Date: 6/7/2004 9:36:31 PM Eastern Standard Time
From: dorisb@us.ibm.com (Bruce Doris)
To: FCooperider@aol.com

EXHIBIT 11

Fred,

I faxed the comments to you.

-Bruce

Headers

Return-Path: <dorisb@us.ibm.com>
Received: from rly-yd05.mx.aol.com (rly-yd05.mail.aol.com [172.18.141.69]) by air-yd02.mail.aol.com (v99_r4.8) with ESMTP id MAILINYD22-21740c5181628f; Mon, 07 Jun 2004 21:36:31 -0400
Received: from e2.ny.us.ibm.com (e2.ny.us.ibm.com [32.97.182.102]) by rly-yd05.mx.aol.com (v99_r4.3) with ESMTP id MAILRELAYINYD55-21740c5181628f; Mon, 07 Jun 2004 21:36:22 -0400
Received: from northrelay04.pok.ibm.com (northrelay04.pok.ibm.com [9.56.224.206])
by e2.ny.us.ibm.com (8.12.10/8.12.2) with ESMTP id i581aL18457604
for <FCooperider@aol.com>; Mon, 7 Jun 2004 21:36:21 -0400
Received: from d01ml076.pok.ibm.com (d01av02.pok.ibm.com [9.56.224.216])
by northrelay04.pok.ibm.com (8.12.10/NCO/VER6.6) with ESMTP id i581b4pX090606
for <FCooperider@aol.com>; Mon, 7 Jun 2004 21:37:04 -0400
In-Reply-To: <ca.2c840e8e.2d21d32@aol.com>
Subject: Re: Status of First Draft for FIS9-2003-0389-US1
To: FCooperider@aol.com
X-Mailer: Lotus Notes Release 6.0.2CF1 June 9, 2003
Message-ID: <OFB3976F4E.F998B264-ON85256EAD.0008C696-85256EAD.0008E218@us.ibm.com>
From: Bruce Doris <dorisb@us.ibm.com>
Date: Mon, 7 Jun 2004 21:36:18 -0400
X-MIMETrack: Serialize by Router on D01ML076/01/M/IBM(Release 6.0.2CF2 HFB2|May 18, 2004) at 06/07/2004 21:36:21
MIME-Version: 1.0
Content-type: text/plain; charset=US-ASCII
X-AOL-IP: 32.97.182.102
X-AOL-SCOLL-SCORE: 0:XXX:XX
X-AOL-SCOLL-URL_COUNT: 0

EXHIBIT 12

Subj: **Re: Status of First Draft for FIS9-2003-0389-US1**
Date: 6/7/2004 10:57:50 PM Eastern Standard Time
From: FCooperrider
To: dorisb@us.ibm.com

Bruce,

I got your comments and will incorporate them into the draft as indicated.
Fred Cooperrider

Subj: Changes to FIS920030389US1 on Local Stressors
Date: 6/8/2004 5:05:12 PM Eastern Standard Time
From: FCooperider
To: dorisb@us.ibm.com

EXHIBIT 13

Bruce,

I received your comments and incorporated them into the application. As I was going over the claims, I realized that they could be broadened in scope if we add a few lines at the end of the specification. So I revised the final paragraphs to be as follows. Please confirm that this version is okay. Possibly, you might want to even add more variations or explanation. This version is currently being prepared to send to the Fishkill IP attorney for filing, so please make changes or comments as soon as possible.

Thanks

Fred Cooperider
McGinn&Gibb, PLLC
ph: (703) 761-2377
email: fcooperider@aol.com

The changes are:

Thus, more specifically, placing the stressors on the source/drain makes the present invention applicable to planar FET structures that do not have the FinFET-fin connectors. But it is also noted that the present invention is not intended as limited to FET-type structures, since it is clearly applicable in a broader environment because of its ability to provide a uni-axial stress region between any of two localized stressors.

In general, the localized stressors of the present invention can be considered as a method of either increasing or decreasing mobility of charge carriers in the region between the stressors. This more generalized definition makes the present invention applicable in devices having either holes as charge carriers (e.g., pMOS-like devices) or having electrons as charge carriers (e.g., nMOS-type devices).

It is further noted that, although the present invention exemplarily demonstrates the incorporation of symmetrical localized stressors, it is also not intended as being limited to this exemplary embodiment. That is, one of ordinary skill in the art, having taken the discussion herein as a whole, will readily recognize that the present invention teaches the technique of incorporating a localized region (e.g., within a device) configured to serve as a localized stressor. The localized stressor could be incorporated in a number of variations of configurations.

As possible non-limiting variations, a single localized stressor could be incorporated within a device and not be interacting with any other stressor, thereby creating an asymmetrically stressed area. A single localized stressor could be incorporated with a non-localized stressor, meaning a stressor that covers an area larger than a single device. A localized stressor could be incorporated in one device and interact with a localized stressor in a second device. Two localized stressors could be interacting with each other, each being different types or degrees of stress.

Finally, it is also noted the number of stressors that are effectively interacting is not limited to the two exemplary localized stressors discussed above. That is, additional stressors could be located as interacting to create a complex three-dimensional stress field between the stressors.

EXHIBIT 14

Subj: Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/9/2004 9:36:21 AM Eastern Standard Time
From: mpepper@us.ibm.com (Margaret Pepper)
To: FCooperider@aol.com

Fred,

Have you received the input from Bruce yet?

PREPARED BY IBM ATTORNEY - PRIVILEGED AND CONFIDENTIAL

Margaret A. Pepper
Staff Attorney, IP Law Department
IBM Corporation
2070 State Route 52, B/300, Z/482
Hopewell Junction, NY 12533
(845) 894-4713, tie-line 533-4713
mpepper@us.ibm.com

FCooperider@aol.
com

06/04/2004 12:31
AM

To
Margaret Pepper/Fishkill/IBM@IBMUS
cc

Subject
Re: Fw: Your Ref. FIS.082; IBM
Docket FIS9-2003-0389-US1

Thanks, Margaret
As soon as we get the inputs from Bruce, we should be close to filing.

Do you have the inventor information in your file. If so, please forward
via

email or fax. If not, I will request via Bruce.

Fred Cooperider
McGinn&Gibb, PLLC
email: fcooperider@aol.com
or mcginn&gibb@aol.com

ph: (703) 761-2377

fax: (703) 761-2375

Subj: Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/9/2004 12:45:21 PM Eastern Standard Time
From: FCooperider
To: mpepper@us.ibm.com

EXHIBIT 19

Margaret,

Yes, and we are in the process of finalizing the application and should be sending it to you in a day or so.

Fred Cooperider
McGinn&Gibb, PLLC

EXHIBIT 16
FIS 082

Subj: Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/14/2004 1:21:37 PM Eastern Standard Time
From: mpepper@us.ibm.com (Margaret Pepper)
To: FCooperider@aol.com

Hi Fred. Just wondering whether this application was sent out yet?

Best regards,

Margaret

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Margaret A. Pepper
Staff Attorney, IP Law Department
IBM Corporation
2070 State Route 52, B/300, Z/482
Hopewell Junction, NY 12533
(845) 894-4713, tie-line 533-4713
mpepper@us.ibm.com

FCooperider@aol.com
06/09/2004 12:45 PM

To
Margaret Pepper/Fishkill/IBM@IBMus
cc

Subject
Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1

Margaret,
Yes, and we are in the process of finalizing the application and
should
be sending it to you in a day or so.
Fred Cooperider
McGinn&Gibb, PLLC

----- Headers -----

Return-Path: <mpepper@us.ibm.com>
Received: from rly-ya05.mx.aol.com (rly-ya05.mail.aol.com [172.18.141.37]) by air-ya01.mail.aol.com (v100.13) with
ESMTP id MAILINYA11-15f40cdde9628b; Mon, 14 Jun 2004 13:21:37 -0400
Received: from e2.ny.us.ibm.com (e2.ny.us.ibm.com [32.97.182.102]) by rly-ya05.mx.aol.com (v99_r4.3) with ESMTP id
MAILRELAYINYA51-15f40cdde9628b; Mon, 14 Jun 2004 13:21:26 -0400
Received: from northrelay04.pok.ibm.com (northrelay04.pok.ibm.com [9.56.224.206])
by e2.ny.us.ibm.com (8.12.10/8.12.2) with ESMTP id i5EHL P18350196

Subj: Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/14/2004 2:23:52 PM Eastern Standard Time
From: FCooperider
To: mpepper@us.ibm.com

Hi, Margaret,

I just got approval from Bruce Doris for some wording at the end where I added spec coverage for broadening the independent claims. I expect to send the package tomorrow.

Fred Cooperider
McGinn&Gibb, PLLC
ph: (703) 761-2377

EXHIBIT 17
FIS082

EXHIBIT 18

Subj: Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1
Date: 6/14/2004 2:47:39 PM Eastern Standard Time
From: mpepper@us.ibm.com (Margaret Pepper)
To: FCooperider@aol.com

Thanks. Please either send the package my overnight courier or express mail, or send electronic versions of the formal papers and final application via the Dropbox ("mpepper@us.ibm.com") and send hardcopies by regular mail.

Best regards,

Margaret

PREPARED BY IBM ATTORNEY - PRIVILEGED AND CONFIDENTIAL

Margaret A. Pepper
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mpepper@us.ibm.com

FCooperider@aol.com
06/14/2004 02:23 PM

To
Margaret Pepper/Fishkill/IBM@IBMUS
cc

Subject
Re: Fw: Your Ref. FIS.082; IBM Docket FIS9-2003-0389-US1

Hi, Margaret,
I just got approval from Bruce Doris for some wording at the end where
I added spec coverage for broadening the independent claims. I expect to
send
the package tomorrow.
Fred Cooperider
McGinn&Gibb, PLLC
ph: (703) 761-2377

Headers

Return-Path: <mpepper@us.ibm.com>

EXHIBIT 19

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McGINN & GIBB, PLLC

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ANNAPOLIS, MD OFFICE
FREDERICK W. GIBB, III
LAWRENCE A. SCOTT†

FACSIMILE COVER SHEET

(This cover page + 17 sheets)

FROM: Frederick E. Cooperrider
Phone: (703) 761-2377

DATE: 6/16/04

TO: Huilong Zhu
Fax: 845-892-6576
Ph: _____

RE: FIS 920030389 US1

COMMENTS: Huilong, Pk. check figures, especially fig 8.,
and in the text, fill in the questions
written in. Thanks. You might want to call me
Fred Cooperrider
(703) 761-2377

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EXHIBIT 20

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JAMES E. HOWARD†
JAMES N. DRESSER
JOHN J. DRESCH
SCOTT M. TULINO
†MEMBER OF BAR OTHER THAN VA

ANNAPOLIS, MD OFFICE
FREDERICK W. GIBB, III
LAWRENCE A. SCOTT†

FACSIMILE COVER SHEET

(This cover page + 23 sheets)

TO:

Margaret Pepper

DATE:

6/22/04

Fax:

845-892-6363

Ph:

FROM:

Frederick E. Cooperrider
Phone: (703) 761-2377

RE:

FS 920030389 US1

COMMENTS:

If acceptable, we will send via
overnight express. Please advise any
changes. Fred Coop

This facsimile message and attachments (if any) may contain information that is privileged, confidential, attorney-work product, or otherwise exempt from disclosure under applicable law. This message and any attachment(s) are intended for only the individual or entity named above (or those properly entitled to access the information). If the reader of this transmission is not the intended or an authorized recipient, any unauthorized distribution, dissemination, or copying of this transmission and the attachment(s), if any, is prohibited.

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Subj: IBM FIS9-2003-0389-US1
Date: 6/22/2004 6:43:04 PM Eastern Standard Time
From: mpepper@us.ibm.com (Margaret Pepper)
To: FCooperrider@aol.com
CC: gunther@mcginngibb.com (Sparkle)

EXHIBIT 21

Fred,

I received your fax. The application looks fine to me. I would appreciate if you could get with Sparkle and send the documents to me by Dropbox tomorrow. This will allow us to start a day earlier converting into the e-filing format and getting inventor signatures. If you are not successful in sending the documents tomorrow morning, then please send everything by overnight express no later than tomorrow (for Thursday delivery).

Many thanks,

Margaret

PREPARED BY IBM ATTORNEY - PRIVILEGED AND CONFIDENTIAL

Margaret A. Pepper
Staff Attorney, IP Law Department
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Hopewell Junction, NY 12533
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Return-Path: <mpepper@us.ibm.com>
Received: from rly-xh04.mx.aol.com (rly-xh04.mail.aol.com [172.20.115.233]) by air-xh01.mail.aol.com (v100.18) with ESMTP id MAILINXH12-4a540d8b5f4283; Tue, 22 Jun 2004 18:43:04 -0400
Received: from e5.ny.us.ibm.com (e5.ny.us.ibm.com [32.97.182.105]) by rly-xh04.mx.aol.com (v99_r4.3) with ESMTP id MAILRELAYINXH49-4a540d8b5f4283; Tue, 22 Jun 2004 18:43:00 -0400
Received: from northrelay04.pok.ibm.com (northrelay04.pok.ibm.com [9.56.224.206])
by e5.ny.us.ibm.com (8.12.10/8.12.2) with ESMTP id i5MMh0Dk659956;
Tue, 22 Jun 2004 18:43:00 -0400
Received: from d01ml255.pok.ibm.com (d01av02.pok.ibm.com [9.56.224.216])
by northrelay04.pok.ibm.com (8.12.10/NCO/VER6.6) with ESMTP id i5MMhIAA121706;
Tue, 22 Jun 2004 18:43:48 -0400
Importance: High
To: FCooperrider@aol.com
Cc: "Sparkle" <gunther@mcginngibb.com>
MIME-Version: 1.0
Subject: IBM FIS9-2003-0389-US1
X-Mailer: Lotus Notes Release 6.0.2CF1 June 9, 2003
From: Margaret Pepper <mpepper@us.ibm.com>
Message-ID: <OF6DC21C37.92B57078-ON85256EBB.007C7A46-85256EBB.007CC9ED@us.ibm.com>
Date: Tue, 22 Jun 2004 18:42:57 -0400
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06/22/2004 18:42:59,
Serialize complete at 06/22/2004 18:42:59
Content-Type: multipart/alternative; boundary="=_alternative 007CC98B85256EBB_="

X-AOL-IP: 32.97.182.105

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EXHIBIT 22

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JAMES E. HOWARD†
JAMES N. DRESSER
JOHN J. DRESCH
SCOTT M. TULINO

†MEMBER OF BAR OTHER THAN VA

ANNAPOLIS, MD OFFICE
FREDERICK W. GIBB, III
MOHAMMAD S. RAHMANT

ER601130017US

June 23, 2004

VIA EXPRESS MAIL

Margaret A. Pepper, Esq.
Attorney, IP Law Department
International Business Machines Corporation
Hudson Valley Research Park
2070 Route 52
Hopewell Junction, NY 12533-6531

Re: New Patent Application
Title: "METHOD AND STRUCTURE FOR STRAINED FINFET DEVICES"
IBM Docket No.: FIS920030389US1
Our Reference: FIS.082

Dear Margaret:

Having received approval of the final draft application from the inventors, enclosed are the final application, formal papers, and U.S.P.T.O. filing documents for the above-identified application. Also enclosed is a diskette which contains the application and formal papers saved in Microsoft Word format.

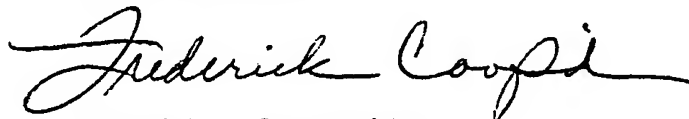
Once we receive confirmation that the application has been filed, we will send the draft drawings to our draftsperson for preparation of the formal drawings.

We take this opportunity to enclose our invoice for services and disbursements in connection with the preparation and filing of this application.

Thank you for allowing us to be of service to you.

With best regards,

Very truly yours,



Frederick E. Cooperrider
Sean M. McGinn

FEC/SMM:jkm
Enclosures

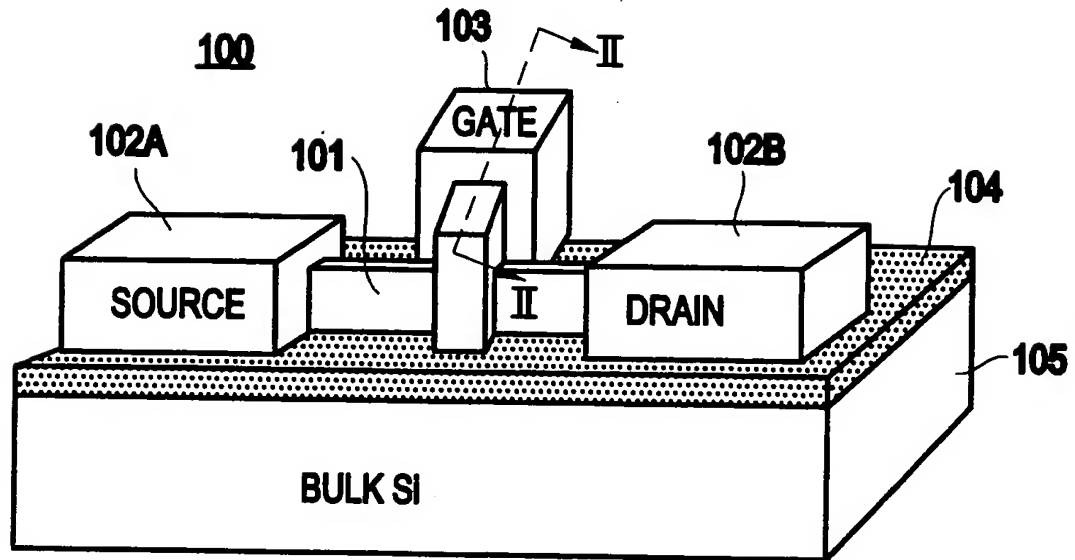


FIG.1

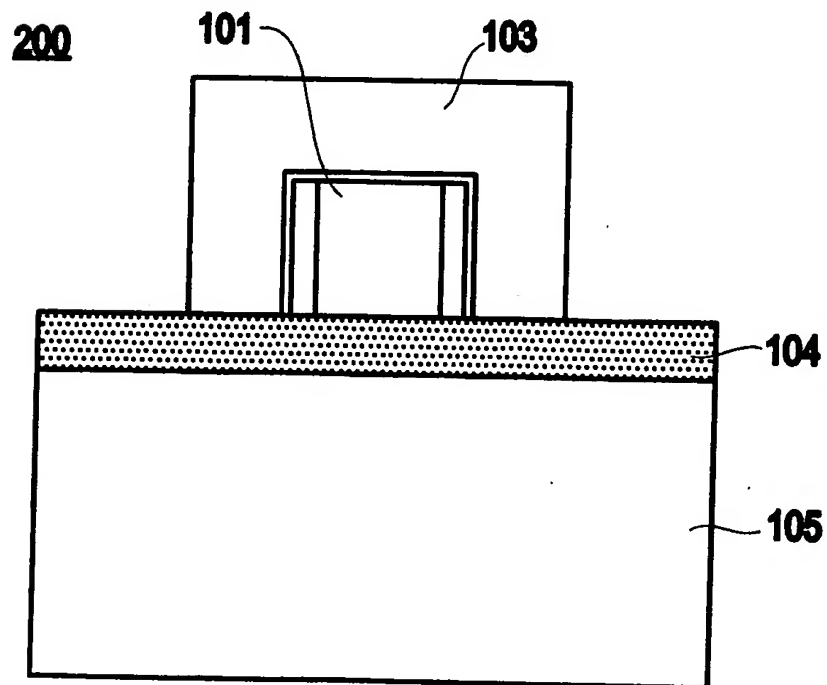


FIG.2

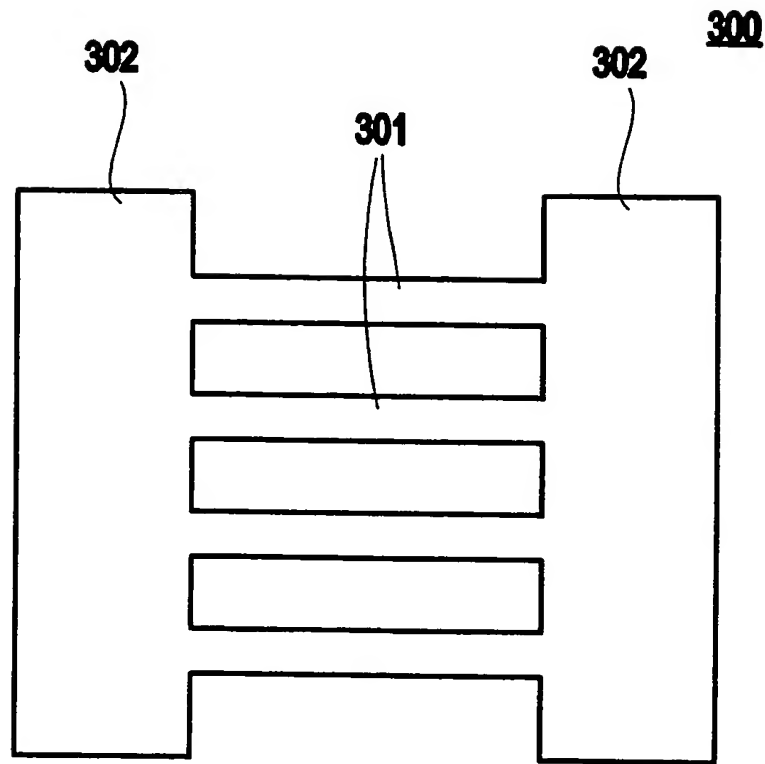


FIG. 3

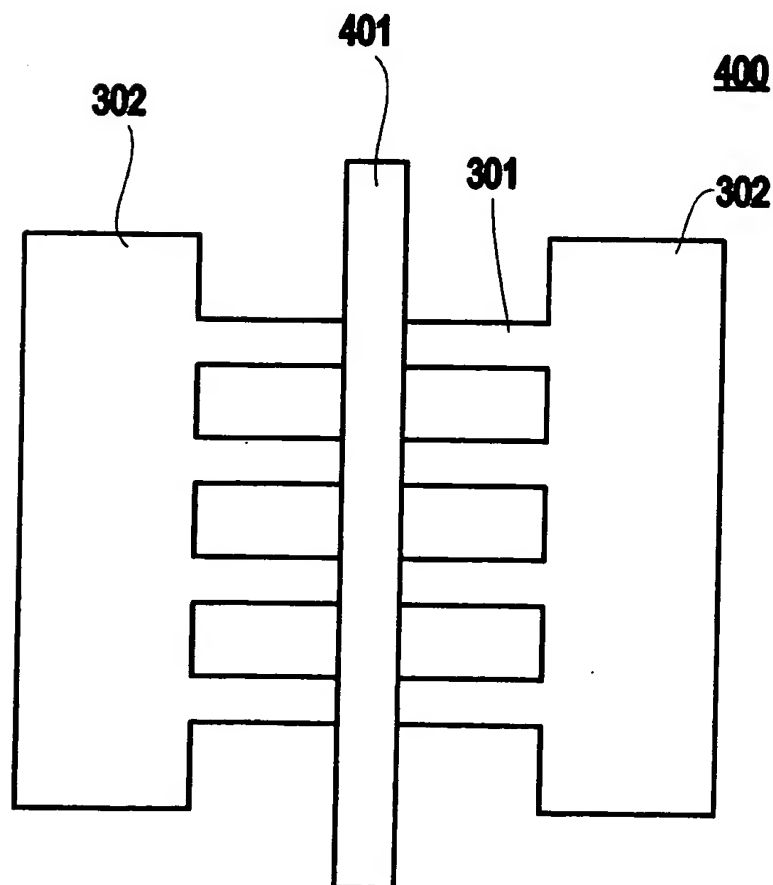
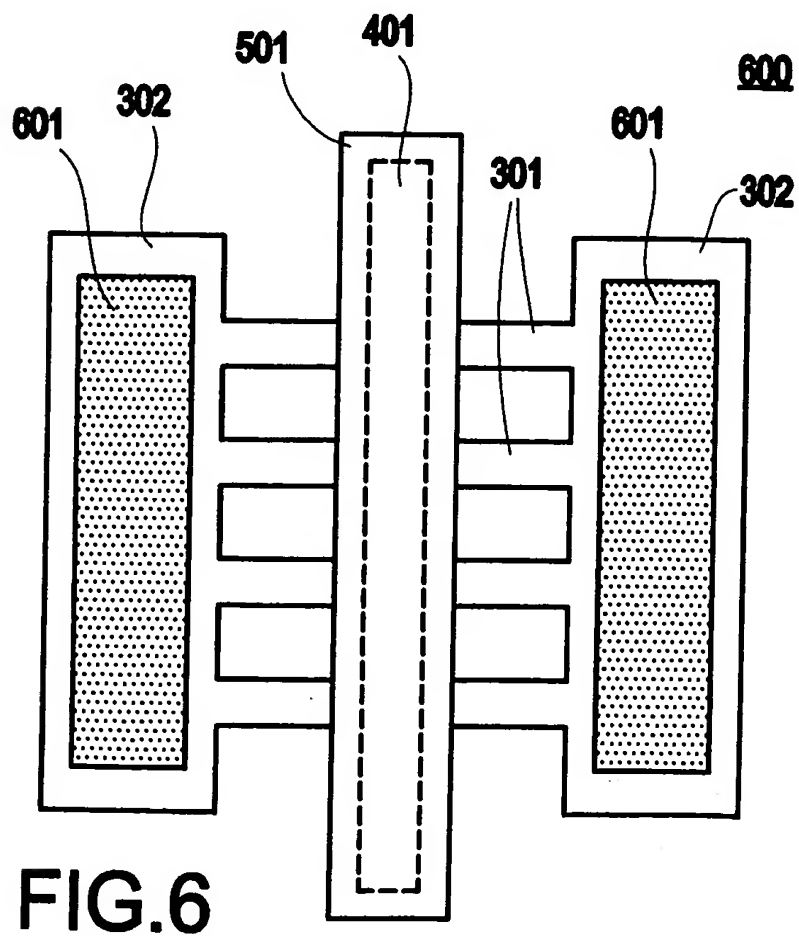
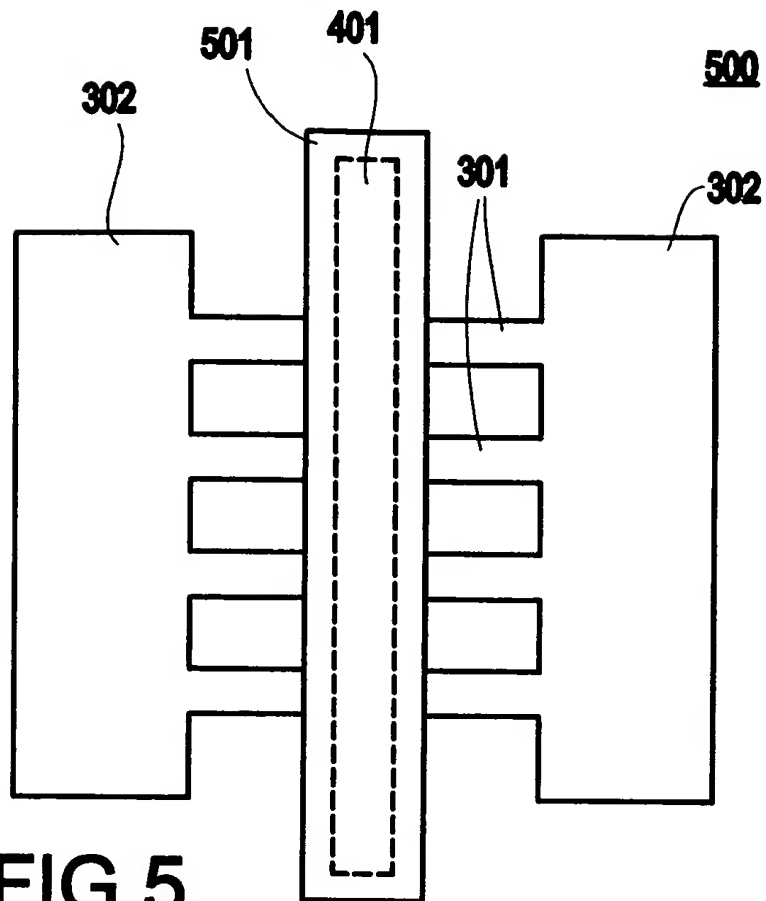


FIG. 4



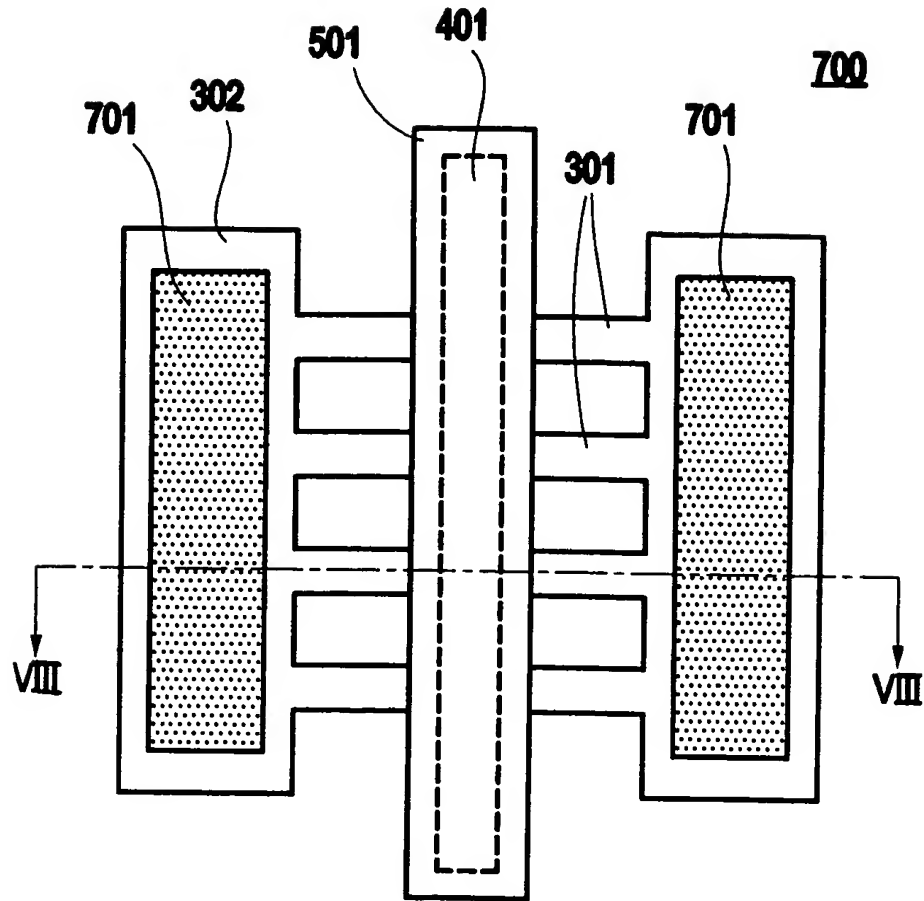


FIG. 7

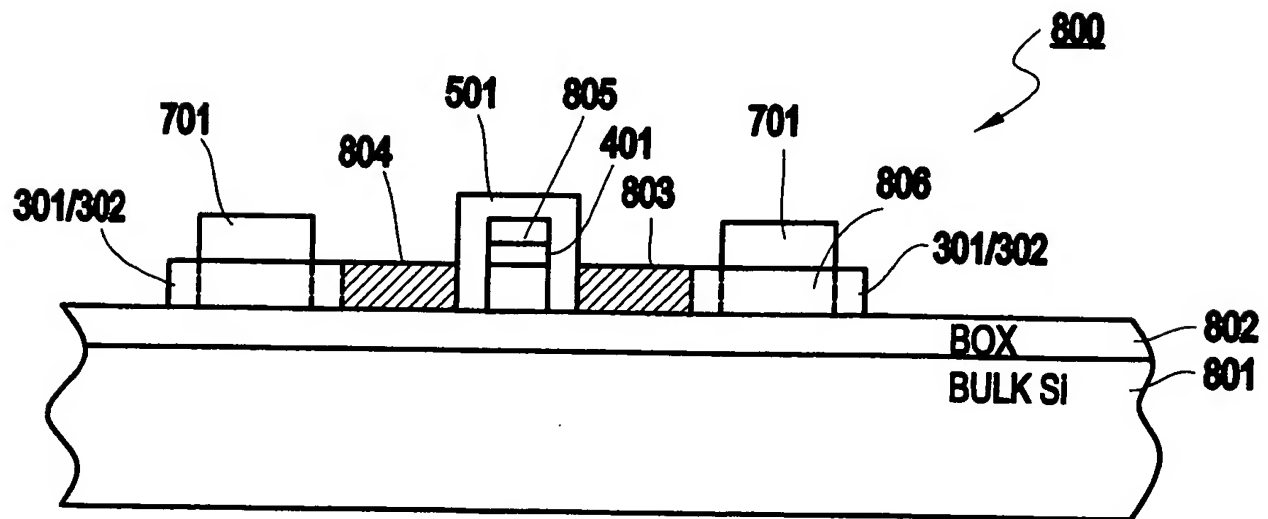
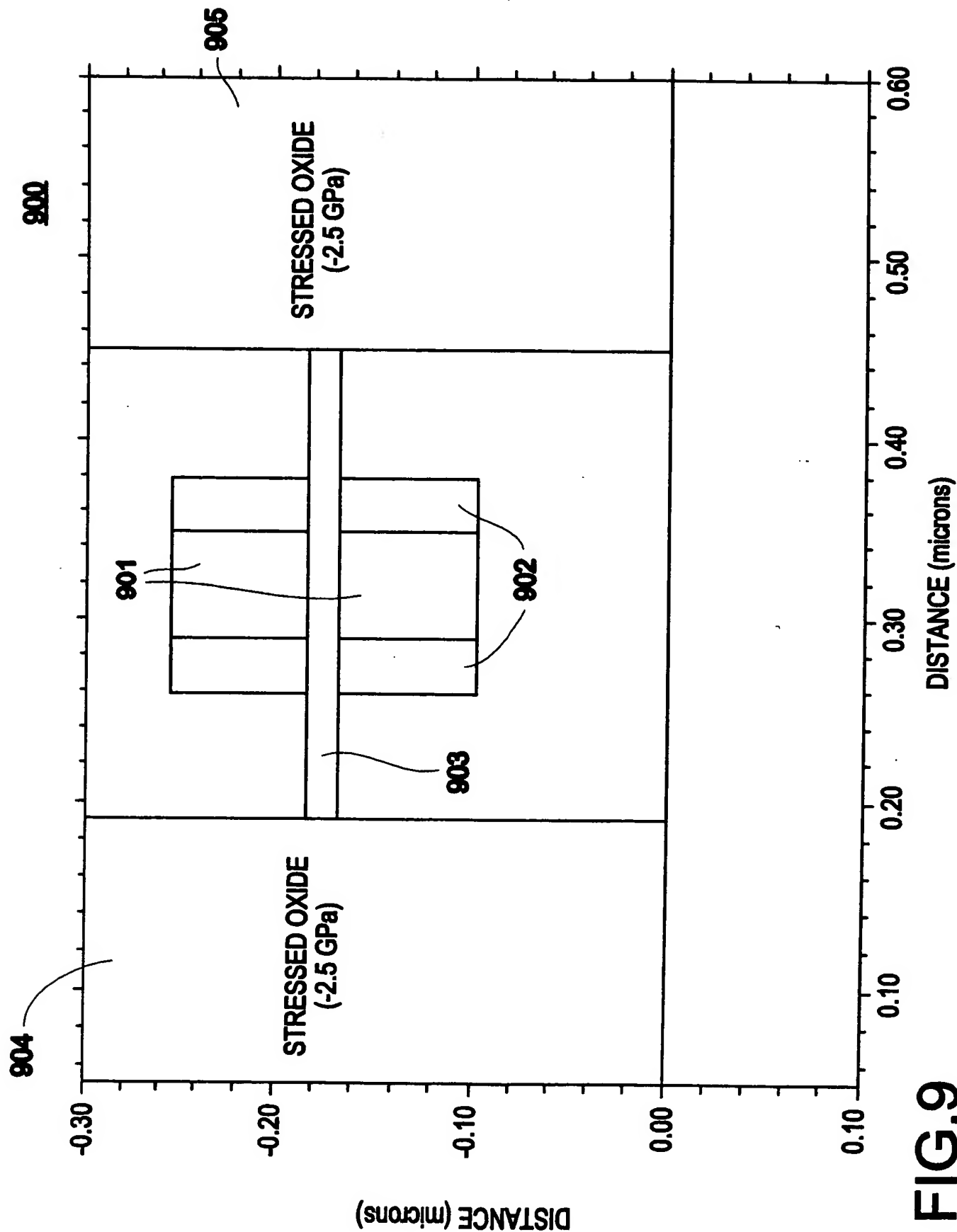


FIG. 8



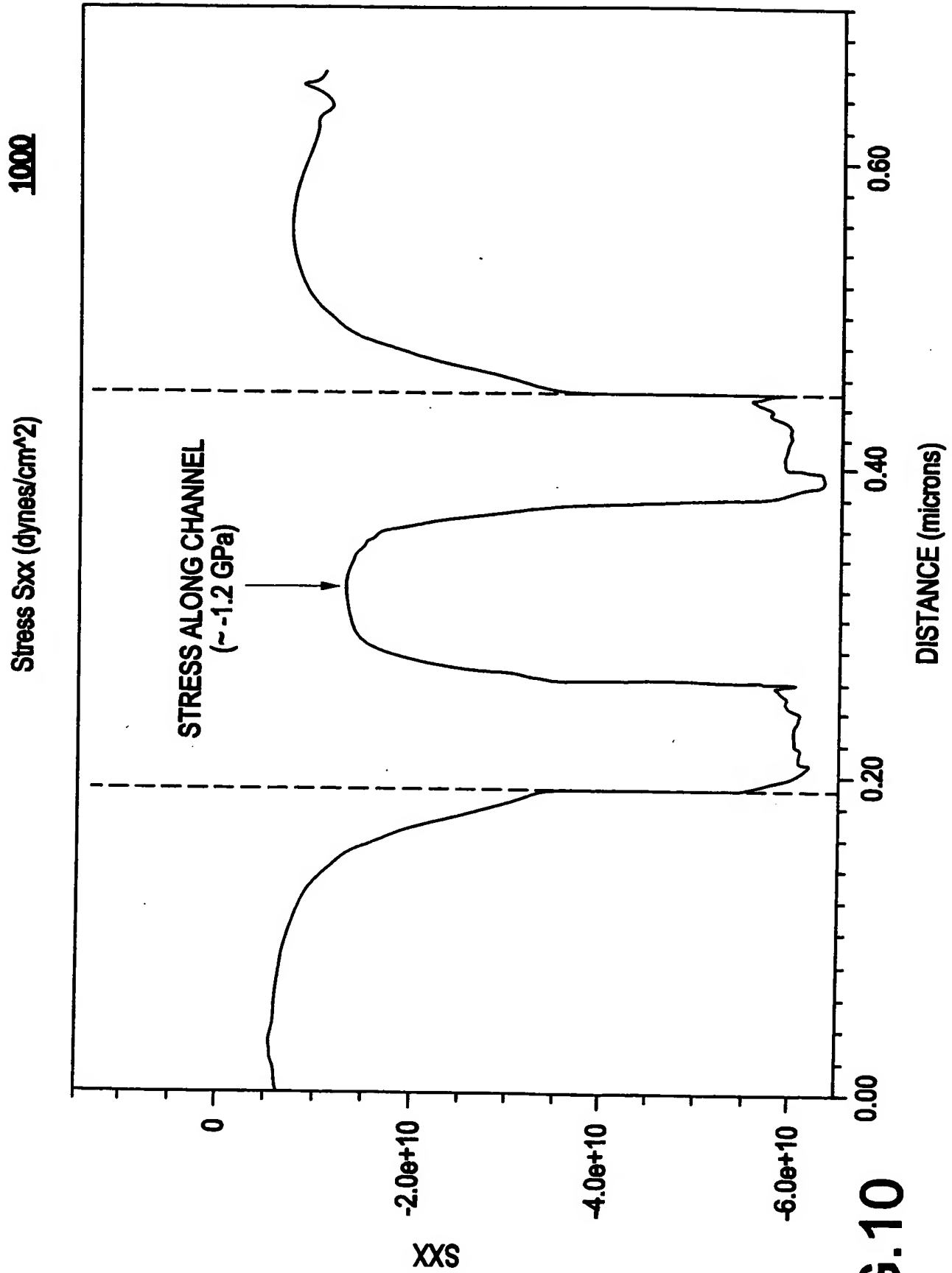


FIG.10

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